



1. Application details

1.1. Permit application details

Permit application No.: 2159/1

Permit type: Area Permit

1.2. Proponent details

Proponent's name: Department of Planning and Infrastructure

1.3. Property details

Property: LOT 881 ON PLAN 217292 (Lot No. 881 DAW BANDY CREEK 6450)

Local Government Area: Shire Of Esperance

Colloquial name: Restoration of Bandy Creek Boat Harbour

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.36		Mechanical Removal	Restoration

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The application is located within Fanny Cove (number 42) vegetation complex indicative of shrublands and Mallee and Acacia scrub on south coastal dunes. The Coastal Dunes comprise of a low scrub of Acacia cyclops, A. saligna and A. cochlearis with scattered Eucalyptus angulosa occurring over a Melaleuca pentagona understorey (BCS 2006).	The vegetation on site has been subject to fire events in the past and consists largely of flora species that are fire and, or, disturbance tolerant. A number of exotic weed species have invaded the site which is considered to be in good to degraded condition (Keighery 1994). Both of the areas of vegetation under application are in a similar condition, however, the condition is marginally better in the southern aspect of the western area under application (Site Inspection Report 2007)	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)	Site Inspection Report (2007) Keighery 1994 Esperance Wildflower Society (Inc) 2007 BCS (2006) Keighery, B.J. (1994)
IBRA Bioregion: - Esperance Plains			

Beard Vegetation Association:
- 42: Shrublands; mallee & acacia scrub on south coastal dunes

Two sites were surveyed on the fringe of both of the proposed areas. The sites are of previously cleared/developed industrial land immediately adjacent to the fishing boat harbour which was constructed in the early 1980's. During a high rainfall event that caused severe flooding in Bandy Creek, severe damage to the east wall of the weir resulted in massive amounts of soil and litter engulfing the harbour basin.

The existing sites surveyed consist of mixed shrubs and herbs representing a low grade mix of common coastal species. It is by no

means an example of intact plant communities of coastal plains. It includes some naturally occurring species as well as many invasive weed species. There is also evidence of exotic garden plants escaping and invading the site, further contributing to the overall corruption of the existing vegetation (Esperance Wildflower Society (Inc) 2007).

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments **Proposal is not likely to be at variance to this Principle**

The proposed areas (1.36ha) are considered to be in good to degraded condition (Keighery 1994), and contain a limited range of commonly occurring flora species and exotic plants. The vegetation on site has been subject to fire events in the past and consists largely of flora species that are fire and, or, disturbance tolerant. Both of the areas of vegetation under application are in a similar condition, however, the condition is marginally better in the southern aspect of the western area under application. No rare or threatened flora was noted occurring within the area under application (Site Inspection Report 2007).

The vegetation comprises a low number of flora species. The two areas concerned contain mostly acacias and other fire and disturbance tolerant species. There is also a substantial degree of weed invasion by exotic annuals including *Avena barbata*, *Conyza* sp., *Lagurus ovatus* and perennials including *Gazania* sp., *Euphorbia* sp., *Eragrostis curvula*, *Leptospermum laevigatum* and *Pelargonium capitatum* (Site Inspection Report 2007).

The dominant vegetation community occurring on the land is acacia scrub on south coast dunes consisting of: Tall Open Scrub (Keighery 1973) of *Acacia cyclops*, *A. saligna*, *A. cochlearis* and larger shrubs of *Spiridium globulosum* over Low Shrubland of *Sollya heterophylla*, *Westringia rigida*, *Phyllanthus calycinus*, and *Lepidosperma gladiatum*, *Pimelea ferruginea* and *Austrostipa elegantissima* (Site Inspection Report 2007).

The two sites surveyed occur on the fringe of existing previously cleared/developed industrial land immediately adjacent to the fishing boat harbour which was constructed in the early 1980's. During a high rainfall event in January 2007 which caused severe flooding in the Bandy Creek catchment, severe damage to the east wall of the weir resulted in massive amounts of soil and litter being deposited in the harbour basin.

The existing sites surveyed consist of mixed shrubs and herbs representing a low grade mix of common coastal species. It is by no means an example of intact plant communities of coastal plains. It includes some naturally occurring species as well as many invasive weed species. There is also evidence of some garden plants having been introduced for aesthetic values, further contributing to the overall corruption of the existing vegetation.

There is a huge weed presence on site. The development of the boat harbour in an estuarine area has reduced the natural vegetation to a poor state and its subsequent industrial use has further contributed to a decline in original species in the nutrient deficient coastal sands (Esperance Wildflower Society (Inc) 2007).

Given this information, the vegetation under application is not considered to comprise a high level of biological diversity.

Methodology Keighery, B.J. (1994)
GIS datasets:
- Esperance Townsite Orthomosaic - Landgate07
- Esperance 1.4m Orthomosaic - DOLA 02
Site Inspection Report (2007)
Esperance Wildflower Society (Inc) (2007).

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments **Proposal may be at variance to this Principle**

Three priority fauna species have been recorded as occurring within 10km radius of the area under application (1.36ha). There are 13 recorded occurrences of Recherche Cape Barren Goose (*Cereopsis novaehollandiae grisea*) (Threatened Fauna: Vulnerable), the closest located 3.4km north west, and 5 recorded occurrences of Hooded Plover (*Charadrius rubricollis*) (Priority 4 Fauna), the closest located 2.8 km north east, within 10km radius of the area under application. Recherche Cape Barren Geese (*Cereopsis novaehollandiae grisea*) (Threatened Fauna: Vulnerable) live primarily in grassland on rocky islands, but also visit pastures and beaches

on the mainland. The Hooded Plover (*Charadrius rubricollis*) (Priority 4 Fauna) lives and breeds on WA coast and on inland lakes, inhabiting inland lakes 100km from the ocean. After breeding, inland birds appear to move to lakes near the west coast or shores of southern lakes. They nest in the upper levels of the beach, in adjacent sand dunes or on shore lakes (foraging for invertebrates). They favour wide beaches and creek mouths or inlet entrances with large flat areas of sand. (Department of Environment, Water, Heritage and the Arts 2000).

Given the above information and also considering that the subject land lies immediately adjacent to the coastal area where Bandy Creek discharges into the created structure of Bandy Creek boat harbour (Site Inspection Report 2007), where the western side of Bandy Creek has been highly cleared, the area under application may be utilised by these species. However, DEC records indicate that there are areas of significant habitat within the 10km local area in much better condition than the areas under application (BCS 2006).

One species of fauna was observed within the site during the period of inspection - Welcome Swallow (*Hirundo neoxena*) (Site Inspection Report 2007).

Methodology SAC Biodatasets 110108
Department of Environment, Water, Heritage and the Arts (2000)
GIS datasets:
- Esperance Townsite Orthomosaic - Landgate07
- Esperance 1.4m Orthomosaic - DOLA 02
Site Inspection Report (2007)
BCS (2006)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposal is not likely to be at variance to this Principle

The proposed areas (1.36ha) are considered to be in good to degraded condition (Keighery 1994) and contain a limited range of commonly occurring flora species and exotic plants that are disturbance tolerant or dependant. The vegetation on site has been subject to fire events in the past and consists largely of flora species that are fire and, or, disturbance tolerant. No rare or threatened flora was noted occurring within the area under application during the site inspection (Site Inspection Report 2007).

Two sites were surveyed on the fringe of both of the proposed areas. No priority or rare flora species were recorded during the survey (Esperance Wildflower Society (Inc) 2007).

There are however, 27 records of 17 Priority flora species in the local area. The Priority One (P1) flora recorded from the local area (10km radius from areas under application) , which may occur in the areas under application are described by DEC's Florabase as:

- Dryandra longifolia subsp. calcicola (Priority 1) - Grows in coastal areas on white sands over limestone.
- Astartea sp. Esperance (A. Fairall 2) (Priority 1) - Grows in saline depressions near salt pans along lake margins on sandy gravels, sandy clays and/or loams.
- Dampiera sericantha (Priority 1) - Grows on plains usually on sand but has been found on gravels.
- Hibbertia carinata (Priority 1) - Grows on well-drained gravelly sand and yellow sands with gravel.
- Lepidium fasciculatum (Priority 1) - No soil information was provided on this species.

Based on the soil description and the preferred habitat of the Priority species it is possible that Priority 1 taxa *Dryandra longifolia* subsp. *calcicola*, *Dampiera sericantha* and *Hibbertia carinata* could occur within the area that has been applied to be cleared (BCS 2006). However, none of these species were identified during the survey.

Other rare/priority species recorded as occurring within 10km radius of the area under application which may occur within the proposed areas given same soil and Beard Vegetation Association include:

- *Pityrodia chrysocalyx* (P3) (Sandy soils)
- *Verticordia vicinella* (P4) (Sand, clay. Low-lying areas)
- *Eucalyptus x missillii* (P4) (Sand over limestone or granite. Coastal sites.)

(WA Herbarium 2008)

However, these species are recorded as being separated by prior land clearing and development.

Given this information, the proposal is unlikely to be necessary for the continued existence of rare and/or priority flora.

Methodology Keighery, B.J. (1994)
Site Inspection Report (2007)
BCS (2006)
SAC Biodatasets 100108
WA herbarium (2008)

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments Proposal is not likely to be at variance to this Principle

The closest Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) is located 8km west of the area under application, being Pink Lake 01 (PEC). This forms a component of a different Beard Vegetation Association to that of the proposed area, and is also separated from the proposed area by development. Given this information, it is unlikely that the proposed areas would be necessary for the maintenance of TEC/PEC .

Methodology SAC Biodatasets 110108

GIS datasets:

- Esperance Townsite Orthomosaic - Landgate07
- Esperance 1.4m Orthomosaic - DOLA 02

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not likely to be at variance to this Principle

The subject land occurs within an area designated as Shrublands; mallee and acacia on south coast dunes (Beard 1979) and comprises one vegetation type within the subject land: Beard Vegetation Association 42. The subject land occurs within the eastern part of the Fannys Cove Vegetation System in the Eyre Botanical District (Beard 1973) (Site Inspection Report 2007).

	Pre-European Extent (ha)*	Current area (ha) *	Remaining extent (%)*	Current Extent Cons %*
Beard Veg Assoc 42:	310085	296496	95.6	46.2
Shire of Esperance:	4242885	3011033	71.0	31.7
Beard Veg Assoc 42:	104245	99506	95.5	68.3
IBRA Bioregion - Esperance Plains:	2899949	1482951	51.1	54.4
Beard Veg Assoc 42:	135427	126434	93.4	57.3

* Shepherd (2006)

The area under application is located in the Shire of Esperance and within the Esperance Plains Bioregion. The extent of pre-European vegetation within these areas is 71.0% and 51.1%, respectively (Shepherd et al., 2001; Shepherd, 2006).

The vegetation proposed to be cleared is a component of Beard Vegetation Association 42 (Hopkins et al., 2001) of which there is 46.2% remaining regionally, and 57.3% remaining locally (Shepherd, 2006).

Methodology EPA (2000)

Shepherd, D.P. (2006)

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2002)

GIS datasets:

- Pre-European Vegetation - DA 01/01
- Esperance 1.4m Orthomosaic - DOLA 02
- Esperance Townsite Orthomosaic - Landgate07
- Interim Biogeographic Regionalisation of Australia - EA 18/10/00

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

The subject land lies immediately adjacent to the coastal area where Bandy Creek discharges into the created structure of Bandy Creek boat harbour (Site Inspection Report 2007). The Lake Warden System which includes Windabout Lakes, Woody Lake and Mullet Lake Nature Reserves occurs within approximately 1.5km to the north. Pink Lake occurs 7.8km west of the proposed areas. The Lake Warden complex is listed under the Ramsar Convention as a wetland of international significance.

Species recorded in the local area are common coastal species (Esperance Wildflower Society (Inc) 2007), and given that the proposed areas occur adjacent to Bandy Creek, the proposed clearing is considered to be

associated with a watercourse.

- Methodology** Site Inspection Report (2007)
Esperance Wildflower Society (Inc) (2007).
GIS datasets:
- Esperance 1.4m Orthomosaic - DOLA 02
 - Esperance Townsite Orthomosaic - Landgate07
 - Hydrography, linear (hierarchy) - DOW
 - Rivers, 1M - GA 01/06/00
 - South Coast Significant Wetlands - DOE 4/8/03
 - RAMSAR, Wetlands

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal may be at variance to this Principle

The application is associated with the Tooregullup Soil System (245To) and the To_5 subsystem. The system is represented by a level to undulating coastal dune system. This level plain system has moderately inclined dune ridges and associated swales with occasional swamps and is linked to calcareous deep sands and associated pale deep sands and minor calcareous shallow sands (BCS 2006).

Soil type (A15): Coastal dunes and their intervening swales with saline flats, swamps, and lakes; some lunettes; some estuarine areas: chief soils seem to be calcareous sands on the recent dunes fronting the coast, and siliceous sands on the older dunes and lunettes. There are various undescribed soils around the saline flats and swamps, around estuarine areas, and on aeolianite. As mapped, areas of unit Ca26 are included, particularly on headlands: hills, small ranges of hills, headlands and off-shore islands, bare rock walls: granitic bosses and tors with shallow leached sands. Associated are small areas of other soils (undescribed). Coastal occurrences may also have dunes of and/or sands piled up against the rocks (Northcote 1960-68).

Salinity in the area has been recorded as 500 - 1000 mg/L TDS (total dissolved solids). Mean annual rainfall has been recorded as 700 mm/year, and evaporation recorded as 1800mm/year. The elevation of the proposed areas is 20m AHD. The soil within the area under application consists of Quaternary aeolian sands which are free draining and are not subject to induced dryland salinity caused by rising water tables (Site Inspection Report 2007).

There is a possible risk of acid-sulphate soils being encountered as well as soil having a low phosphorus retention index and a moderate to extreme risk of wind erosion, given the sandy soil type and proximity to the coast. The area has a low to nil risk of waterlogging given the combination of rainfall and soil type. (DAFWA 2006).

Given this information, the proposed clearing may cause appreciable land degradation in the form of wind erosion.

In order to mitigate the possible erosion and salinity-induced impacts, wind erosion conditions will be imposed if the proposed clearing is granted.

- Methodology** Site Inspection Report (2007)
DAFWA (2006)
Northcote, K. H et al. (1960-68)
GIS datasets:
- Soils, Statewide - DA 11/99
 - Isohyets - BOM 09/98
 - Groundwater Salinity, Statewide - DOW
 - Topographic Contours, Statewide - DOLA 12/09/02
 - Rainfall, Mean Annual - BOM 30/09/01
 - Acid Sulfate Soil Risk Map, Albany-Torbay - DEC

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is not likely to be at variance to this Principle

Woody lakes Nature Reserve is located 1.8km north west and Mullet Lake Nature Reserve is located 1.75km north east of the proposed areas. Both are on the Register of National estate as Esperance Lakes Nature Reserve, and both form a very small component of Beard Vegetation Association 42. The closest area reserved for conservation is a System Number 3 Reserve located 350m south east of the proposed areas, which forms a component of a different Beard vegetation Association to that of the proposed areas.

Given the small scale of proposed clearing (1.36ha) of vegetation considered to be in good ? degraded condition (Keighery 1994), and distance between the reserves and proposed areas, it is unlikely that the proposed clearing will impact on the environmental values of these conservation areas.

- Methodology** Keighery, B.J. (1994)

Site Inspection Report (2007)

GIS datasets:

- Pre-European Vegetation - DA 01/01
- CALM Managed Lands and Waters - CALM 1/07/05
- WRC Estate - DOW
- Register of National Estate - EA 28/01/03

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

Salinity in the area has been recorded as 500 - 1000 mg/L TDS (total dissolved solids). Mean annual rainfall has been recorded as 700 mm/year, and evaporation recorded as 1800mm/year. The elevation of the proposed areas is 20m AHD. The soil within the area under application consists of Quaternary aeolian sands which are free draining and are not subject to induced dryland salinity caused by rising water tables (Site Inspection Report 2007).

Drainage from the property is internal to swales and depressions and external to Bandy Creek. Sheet flow might only occur in high rainfall events. There is a possible risk of acid-sulphate soils being encountered as well as soil having a low phosphorus retention index (DAFWA 2006).

Clearing within the proposed clearing area is not likely to cause deterioration in the quality of surface water or run-off. Surface water is not likely to accumulate on the free-draining coastal aeolian sands comprising this land. Underground water on land immediately adjacent to the boat harbour is likely to be infused by salt from the seawater within the boat harbour (Site Inspection Report 2007).

Given the above information, the proposed clearing is unlikely to cause deterioration in the quality of surface or underground water.

Methodology DAFWA (2006)

Site Inspection Report (2007)

GIS Datasets:

- Rainfall, Mean Annual - BOM 30/09/01
- Topographic Contours, Statewide - DOLA 12/09/02
- Public Drinking Water Source Areas (PDWSAs) - DOW
- Acid Sulfate Soil Risk Map, Albany-Torbay ? DEC
- Isohyets - BOM 09/98
- Groundwater Salinity, Statewide - DOW

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The subject land appears to be above the level subject to flooding that occurred on 6 Jan 2007. Flooding in Bandy Creek was partly attributed to the presence of a weir across the point where the creek enters the boat harbour which initially caused an upstream bank-up of waters during the flood. The purpose of the weir was to prevent tidal influences of sea water affecting the lower reaches of Bandy Creek (Site Inspection Report 2007).

Mean annual rainfall has been recorded as 700 mm/year, and evaporation recorded as 1800mm/year. The elevation of the proposed areas is 20m AHD. The soil within the area under application consists of Quaternary aeolian sands which are free draining (Site Inspection Report 2007). The area has a low to nil risk of waterlogging given the combination of rainfall and soil type. (DAFWA 2006).

Drainage from the property is internal to swales and depressions and external to Bandy Creek. Sheet flow might only occur in high rainfall events (DAFWA 2006).

Given this information, the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding.

Methodology DAFWA (2006)

Site Inspection Report (2007)

GIS Datasets:

- Rainfall, Mean Annual - BOM 30/09/01
- Topographic Contours, Statewide - DOLA 12/09/02
- Isohyets - BOM 09/98

Planning Instrument, Native Title, Previous EPA decision or other matter.

Comments

The Shire of Esperance has advised to rehabilitate cleared areas on completion of works using stored topsoil material from the site.

There is one Native Title claim over the area under application, but as the property is privately owned, the granting of the clearing permit is a secondary approval and does not constitute a future act under the Native Title Act 1993.

Methodology

DAFWA (2006)
Shire of Esperance (2008)

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Restoration	Mechanical Removal	1.36	<p>The assessable criteria have been assessed. The proposed clearing is at variance to Principle (f); may be at variance to Principle (b) and (g); and is not likely to be at variance to Principle (a), (b), (c), (d), (e), (h), (i) and (j).</p> <p>Weeds and erosion control conditions have been imposed if permit is granted.</p> <p>Weeds and erosion control conditions have been imposed if permit is granted.</p>

5. References

- Clearing Assessment Unit's biodiversity advice for land clearing application. Advice to Director General, Department of Environment and Conservation (DEC), Western Australia. TRIM ref xxxxx
- DAFWA Land degradation assessment report. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture and Food Western Australia. DoE TRIM ref XXXXX.
- Department of Environment and Conservation (DEC) (2007) Site Inspection Report Application CPS 2159/1 TRIM ref: DOC43247
- Department of Environment, Water, Heritage and the Arts (2000) The Action Plan for Australian Birds. Environment Australia
- EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority.
- Esperance Wildflower Society (Inc) (2007) Bandy Creek Fishing Boat Harbour Survey TRIM ref: DOC36798
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- Shepherd, D.P. (2006). Adapted from: Shepherd, D.P., Beeston, G.R., and 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Shire of Esperance (2008) Letter RE: Application to Clear Native Vegetation - Lot 881 on Plan 217292 Reserve 39635, Esperance. TRIM ref: DOC84595
- Western Australian Herbarium, Department of Environment and Conservation. Florabase (<http://florabase.dec.wa.gov.au/>). Accessed 15 January 2008.

6. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System

ha Hectare (10,000 square metres)
TEC Threatened Ecological Community
WRC Water and Rivers Commission (now DEC)